

PHASE I BOOK EXPLOITATION SOV/5763

Vaynberg, David Veniaminovich, and Aleksandr Leonidovich Sinyav-
skiy

Raschet obolochek (Calculation for Casings) Kiyev, Gosstroyizdat
UkrSSR, 1961. 118 p. 5500 copies printed.

Ed.: I. Ye. Reznichenko; Tech. Ed.: V. P. Boyko.

PURPOSE : This book is intended for engineers and scientific
workers. It may also be useful to aspirants and students
at technical schools of higher education.

COVERAGE: The book deals with a method for computing shells
which is based on the use of the solution of problems of
two-dimensional stress conditions and bending of plates.
Cylindrical shells with rectangular and elliptical cutouts
are examined. V. Z. Zhdan, V. G. Gorchakov, and I. Z.
Roytfarb, aspirants, cooperated in compiling and computing
materials for tables. The author thanks O. D. Oniashvili.

Card 1/4

VAYNBERG, D.V.

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S/021/60/000/007/007/009

D211/D305

AUTHORS: Vaynberh, D.V., and Synyavs'kyy, O.L.

TITLE: Applying the method of potentials to the numerical analysis of the deformation of a cylindrical shell

PERIODICAL: Akademiya nauk Ukrayins'koyi RSR. Dopovidi, no.7, 1960, 907 - 912

TEXT: The aim of the paper is to give the numerical method of solving a system of integral equations of the theory of a thin cylindrical shell. The author starts with the general differential equations for statical equilibrium of the cylindrical shell by linear deformations. They are

$$\begin{aligned} \frac{\partial^2 u}{\partial \alpha^2} + \frac{1-\nu}{2} \cdot \frac{\partial^2 u}{\partial \beta^2} + \frac{1+\nu}{2} \cdot \frac{\partial^2 v}{\partial \alpha \partial \beta} + \frac{\nu}{R} \cdot \frac{\partial w}{\partial \alpha} &= - \frac{1-\nu^2}{Eh} X, \\ \frac{1+\nu}{2} \cdot \frac{\partial^2 u}{\partial \alpha \partial \beta} + \frac{\partial^2 v}{\partial \beta^2} + \frac{1-\nu}{2} \cdot \frac{\partial^2 v}{\partial \alpha^2} + \frac{1}{R} \cdot \frac{\partial w}{\partial \beta} &= - \frac{1-\nu^2}{Eh} Y, \end{aligned} \quad (1)$$

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$$\frac{\nu}{R} \frac{\partial u}{\partial \alpha} + \frac{1}{R} \frac{\partial v}{\partial \beta} + c^2 \nabla^2 w + \frac{1}{R^2} w = \frac{1-\nu^2}{Eh} Z. \quad (1)$$

where α, β are coordinates of the mean surface, u, v, w , displacements in the direction of axes α, β, n ; X, Y, Z - components of external loading, R - radius of curvature, n - thickness of the shell; $c^2 = h^2/12$. As a fundamental state the cylindrical panel was considered, loaded at the point (α_0, β_0) with the normal force Q and with the following boundary conditions

$$\begin{aligned} u = 0, w = 0, M_2 = 0, N_2 = 0 \text{ for } \alpha = 0, \alpha = \alpha_1, \\ v = 0, w = 0, M_1 = 0, N_1 = 0 \text{ for } \beta = 0, \beta = \beta_1. \end{aligned} \quad (2)$$

Three auxiliary states were considered simultaneously. State 1. means a plane rectangular plate, being the development of the shell, loaded at the point (α, β) in the direction 1. In this case, the differential equations for the displacements u_1, v_1

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$$\begin{aligned} \frac{\partial^2 u_1}{\partial \xi^2} + \frac{1-\nu}{2} \cdot \frac{\partial^2 u_1}{\partial \eta^2} + \frac{1+\nu}{2} \cdot \frac{\partial^2 v_1}{\partial \xi \partial \eta} &= -\frac{1-\nu^2}{Eh} \delta(\xi - \alpha, \eta - \beta) \\ \frac{1+\nu}{2} \cdot \frac{\partial^2 u_1}{\partial \xi \partial \eta} + \frac{\partial^2 v_1}{\partial \eta^2} + \frac{1-\nu}{2} \cdot \frac{\partial^2 v_1}{\partial \xi^2} &= 0. \end{aligned} \quad (3)$$

would be obtained from the first two equations (1) by putting

$$R = \infty, w = 0, u = u_1, v = v_1, Z = Y = 0.$$

To satisfy equations beside the force at point (α, β) in the direction 1. the normal load $H_1(\xi, \eta, \alpha, \beta)$ spread over the surface of the shell should be introduced: $H_1(\xi, \eta, \alpha, \beta) =$

$$= \frac{Eh}{1-\nu^2} \cdot \frac{1}{R} \left[\nu \frac{\partial u_1}{\partial \xi} + \frac{\partial v_1}{\partial \eta} \right]. \quad (6)$$

Applying the theorem of mutual work to the fundamental and to the auxiliary state described by Eq. (6) and by displacements $u = u_1$

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$v = v_1$, $w = 0$, a further equation is obtained where the integral is taken over the surface of the plate. Similarly, for the second auxiliary state, the displacements $u = u_2$, $v = v_2$, and the additional load

$$H_2(\xi, \eta, \alpha, \beta) = \frac{Eh}{1-\nu^2} \cdot \frac{1}{R} \left[\nu \frac{\partial u_2}{\partial \xi} + \frac{\partial v_2}{\partial \eta} \right] \quad (8)$$

are introduced, and the corresponding integral equation obtained. The third auxiliary state was obtained from formulae (1) by putting $R = \infty$, $u = 0$, $w = w_3$; the corresponding differential equation had the form

$$\nabla^2 \nabla^2 w_3 = \frac{12(1-\nu^2)}{Eh^3} \delta(\xi - \alpha, \eta - \beta). \quad (10)$$

[Abstractor's note: Meaning of δ not determined]. To induce to the panel a displacement $u = v$, $v = 0$, $w = w_3$, the additional transver-

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sal loading must be introduced with components

$$H_3(\xi, \eta, \alpha, \beta) = -\frac{Eh}{1-\nu^2} \cdot \frac{\nu}{R} \cdot \frac{\partial w_3}{\partial \xi}, \text{ along the axis } \alpha \quad (12)$$

$$H_4(\xi, \eta, \alpha, \beta) = -\frac{Eh}{1-\nu^2} \cdot \frac{1}{R} \cdot \frac{\partial w_3}{\partial \eta}, \text{ along the axis } \beta \quad (13)$$

$$H_0(\xi, \eta, \alpha, \beta) = \frac{Eh}{1-\nu^2} \cdot \frac{1}{R^2} w_3, \text{ along the axis } n. \quad (14)$$

Using the net as shown in the diagram and using the method of trapeziums, 15 algebraical equations are derived giving the values of u_1, u_2, \dots, u_{25} as functions of values w_1, w_2, \dots, w_9 . The values of $v_1, v_2, \dots, v_9, v_{11}, v_{12}, v_{13}, v_{19}, v_{20}, v_{21}$ were obtained as functions of w_1, w_2, \dots, w_9 . Substituting these values into 9 equations a further set of 9 equations are obtained

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Applying the method of potentials ...

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$$w_1 = -\frac{\lambda^4}{R^4 A^4} [0.048 w_1 + 0.024 w_2 + 0.011 w_3 + 0.024 w_4 + 0.019 w_5 + 0.009 w_6 + 0.007 w_7 + 0.006 w_8 + 0.003 w_9] + 0.097 \frac{Q_1^2}{A^4}$$

from which w_1, w_2, \dots, w_9 could be calculated. Comparison of the obtained results with the solutions of V.Z. Vlasov (Ref. 1: Obshchaya teoriya obolochek (General Theory of Shells) GITTL, 1949) shows the difference not greater than 10 %. Finally, the authors show the solution of a integral equation

$$w(\alpha, \beta) + \iint F(\xi, \eta, \alpha, \beta) w(\xi, \eta) d\xi d\eta = f(\alpha, \beta) \quad (17)$$

by using the method of successive approximation, proposed by Yu.D. Sokolov (Ref. 4: UMZh, 9, 1, 82, 1957). There are 1 figure and 4 Soviet-bloc references.

ASSOCIATION: Instytut budivel'noyi mekhaniky (Institute of Building Mechanics)

SUBMITTED: July 14, 1959

Card 6/7

VAYNBERG, D.V. (Kiyev); ZARUTSKIY, V.A. [Zaruts'kyi, V.O.] (Kiyev);
ITENBERG, B.Z. (Kiyev)

Stressed state of cylindrical shells reinforced with ribs. Prykl.
mekh. 6 no.4:375-384 '60. (MIRA 13:11)

1. Institut stroitel'noy mekhaniki AN USSR.
(Elastic plates and shells)

VAYNBERG, David Veniaminovich, doktor tekhn. nauk, prof.; SINYAVSKIY,
~~Aleksandr Leonidovich~~; REZNICHENKO, I.Ye., red.; BOYKO, V.P., tekhn.
red.

[Design of shells] Raschet obolochek. Kiev, Gos. izd-vo lit-ry po
stroit. i arkhitekt. USSR, 1961. 118 p. (MIRA 14:9)
(Plastic plates and shells)

SHTEYNVOL'F, Lev Izrailevich; VAYNBERG, D.V., doktor tekhn. nauk, prof.,
retsenzent; STAROSEL'SKIY, A.A., kand. tekhn.nauk, dots., retsen-
zent; EPSHTEYN, Yu.V., kand. tekhn. nauk, dots., red.; FURER, P.Ya.,
red.; GORNOSTAYPOL'SKAYA, M.S., tekhn. red.

[Dynamic calculation of machines and mechanisms] Dinamicheskie
raschety mashin i mekhanizmov. Moskva, Gos. nauchno-tekhn. izd-
vo mashinostroit. lit-ry, 1961. 339 p. (MIRA 14:9)
(Machinery—Design and construction)

VAYNBERG, D. V.; SINYAVSKIY, A. L. [Syniavs'kiy, O. L.]

Stress concentration in disks with apertures of special shape. Dop.
AN URSR no. 10:1358-1362 '60. (MIRA 13:11)

1. Kiyevskiy inzhenerno-stroitel'nyy institut. Predstavleno aka-
demikom AN USSR F. P. Belyankinym [Beliiankin, F. P.]
(Elastic plates and shells)

VAYNBERG, D.V.; SINYAVSKIY, A.L. [Syniavs'kiy, O.L.]

Application of the method of potentials to the numerical analysis
of the deformation of a cylindrical shell. Dop.AN USSR no.7:907-
912 '60. (MIRA 13:8)

1. Institut stroitel'noy mekhaniki AN USSR. Predstavleno akademikom
AN USSR F.P.Belyankinym [F.P.Beliiankinym].
(Elastic plates and shells)

GROZIN, B.D., otv.red.; DRAYGOR, D.A., zam.otv.red.; BARABASH, M.L.,
red.toma; KRAGEL'SKIY, I.V., red.; SERESEN, S.V., red.;
FAYNERMAN, I.D., red.; ZASLAVSKIY, S.S., red. Prinimeli
uchastiye: BRAUN, M.P., prof.; VAYNBERG, D.V., prof.; PETRENKO,
I.P., kand.tekhn.nauk; SINYAVSKAYA, M.D., inzh.; SHEVCHUK, V.A.,
kand.tekhn.nauk; SEMIROG-ORLIK, V.N., kand.tekhn.nauk; YANKEVICH,
V.F., inzh.; GORB, M.L., kand.tekhn.nauk; RAKHLINA, N.P.,
tekhn.red.

[Increasing the wear resistance and useful life of machinery in
two volumes] Povyshenie iznosostoikosti i sroka sluzhby mashin
v dvukh tomakh. Kiev, Izd-vo Akad.nauk USSR. Vol.1. 1960.
486 p. (MIRA 13:12)

1. Vsesoyuznoye nauchno-tekhnicheskoye obshchestvo mashino-
stroitel'noy promyshlennosti. Kiyevskoye oblastnoye pravleniye.
(Mechanical wear)
(Mechanical engineering)

S/021/60/000/006/006/019
A153/A029

16.7300

AUTHORS: Vaynberg, D.V.; Itenberg, B.Z.

TITLE: Asymmetrical Deformation of Constructive-Orthotropic Shells

PERIODICAL: Dopovidi Akademiyi nauk Ukrayins'koyi RSR, 1960, Nr. 6, pp. 761 - 765

TEXT: The authors present a purely mathematical method for the investigation of asymmetrical deformation of shells of rotation, reinforced by a sufficiently dense network of orthogonal ribs along the lines of principal curvatures. Such a spatial construction, allowing for the shearing strains, is regarded as a constructive-orthotropic shell. A system of equations is presented for the solution of asymmetrical deformations of the above-specified shells (14 - 16), which are further developed for the case of the above-mentioned deformations when an extraneous surface load is absent (18 - 21). An example of the boundary effect of a cylindrical constructive-orthotropic shell is discussed. Figure 1 shows the magnitudes of sagging and forces instrumental in the creation of the boundary effect. There is 1 figure.

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A153/A029

Asymmetrical Deformation of Constructive-Orthotropic Shells

ASSOCIATION: Instytut mekhaniky AN UkrSSR (Institute of Mechanics of the AS
UkrSSR)

PRESENTED: by F.P. Byelyankin, Academician, AS UkrSSR

SUBMITTED: July 6, 1959

Card 2/2

VAYNBERG, David Veniaminovich; VAYNBERG, Yevgeniya Davidovna; REZNICHENKO,
I., red.; IOAKIMIS, A., tekhn.red.

[Plates and disks; strength, stability, and vibrations] Plastiny,
diski, balki-stenki; prochnost', ustoichivost' i kolebaniia.
Kiev, Gos.izd-vo lit-ry po stroit. i arkhit.USSR, 1959. 1048 p.
(MIRA 13:2)

(Elastic plates and shells)

17

CA VAYNBERG, C.

Edible pepsin from the stomach mucosa of cattle.
I. Vaynberg... *Myrmaya Ind.* S.S.S.R. 20, No. 2, 87-9
1979. — A method for extr. of pepsin from cattle stomach
mucosa is presented. A dil. HCl soln. of pH 2 and temp.
40° is used in the extrn. The ratio of raw material to
solvent in the 3 extrns. are, resp.: 1:2.5, 1:1.75, and 1:1.
The ext. is dried at 35-38°. M. M. Piskur

GROZIN, B.D., otv.red.; DRAYGOR, D.A., zam.otv.red.; SAMOKHVALOV, Ya.A., red.toma; BRAUN, M.P., red.; FAYNERMAN, I.D., red.; KRAGEL'SKIY, I.V., red.; BARABASH, M.L., red. Prinsipali uchastiye: VAYNBERG, D.V., prof.; PETRENKO, I.P., kand.tekhn.nauk; SINYAVSKAYA, M.D., inzh.; SHEVCHUK, V.A., kand.tekhn.nauk; SEMIROG-ORLIK, V.N., kand.tekhn.nauk; YANKEVICH, V.F., inzh.; GORB, M.L., kand.tekhn.nauk; RAKHLINA, N.P., tekhn.red.

[Increasing the wear-resistance and life of machinery] Povyshenie iznosostoičnosti i sroka sluzhby mashin. Kiev, Izd-vo Akad.nauk USSR. Vol.2. 1960. 290 p. (MIRA 14:1)

1. Vsesoyuznoye nauchno-tekhicheskoye obshchestvo mashinostroi-
tel'noy promyshlennosti. Kiyevskoye oblastnoye pravleniye.
(Mechanical wear) (Machinery)

VAYNBERG, G.D., inzh.; KRICHEVSKAYA, Ye.I., kand. tekhn. nauk;
MAZALOV, A.N., inzh.; ROZENFEL'D, A.G., inzh.; FOLOMIN,
A.I., doktor tekhn. nauk; TESLER, P.A., kand. tekhn. nauk;
SHOLOKHOV, V.G., arkhitekt.; RUBANENKO, B.R., glav. red.;
ROZANOV, N.P., zam. glav. red.; ONUFRIYEV, I.A., red.;
YUDIN, Ye.Ya., red.; NASONOV, V.N., red.; ISIDOROV, V.V.,
red.; MAKARICHEV, V.V., red.; POLUBNEVA, V.I., inzh., red.

[Improving the durability of industrial built-up roofs]
Voprosy povysheniya dolgovechnosti industrial'nykh sovme-
shchennykh krysh. Moskva, Gosstroizdat, 1962. 43 p.
(MIRA 17:4)

1. Akademiya stroitel'stva i arkhitektury SSSR. Nauchno-
issledovatel'skiy institut organizatsii, mekhanizatsii i
tekhnicheskoy pomoshchi stroitel'stvu. 2. Tsentral'nyy
nauchno-issledovatel'skiy i proyektno-eksperimental'nyy
institut industrial'nykh, zhilykh i massovykh kul'turno-
bytovykh zdaniy Akademii stroitel'stva i arkhitektury SSSR
(for Vaynberg, Krichevskaya, Mazalov, Rozenfel'd, Folomin).
3. Nauchno-issledovatel'skiy institut stroitel'noy fiziki
Akademii stroitel'stva i arkhitektury SSSR (for Sholokhov).
4. Nauchno-issledovatel'skiy institut betona i zhelezob-
tona Akademii stroitel'stva i arkhitektury SSSR, Perovo
(for Tesler).

VAYNBERG, G.D., inzh.; YEVTIKHIN, V.F., kand. tekhn. nauk; KAZAKOV,
I.V., inzh.; KAL'NITSKIY, A.A., kand. tekhn. nauk; NIKOLAYEV,
N.A., kand.tekhn.nauk, nauchn. red.

[Asbestos cement elements in rural construction for residen-
tial, cultural, and industrial buildings] Asbestotsementnye
konstruktsii v sel'skom stroitel'stve dlia zhilykh, kul'turno-
bytovykh i proizvodstvennykh zdani. [By] G.D.Vainberg i dr.
Moskva, Stroiizdat, 1965. 63 p. (MIRA 18:3)

SKIRDOVA, K.M.; VAYNBERG, G.F.; KOPYL, A.N.

New types of light-diffusing film material suitable for
lamp shades. Plast.massy no.7:48-49 '62. (MIRA 15:7)
(Plastic films)
(Lamp shades)

VAYNBERG, G.S.

Nov 52

USSR/Electricity - Induction Heating

~~Metallurgy~~

"Problem of the Selection of Generators to Step Up Frequency for Induction Smelting Furnace," Engr G. S. Vaynberg

From Energet, No 11, pp 23-24

Published in interests of discussion. Advocates, on basis of work done by A. V. Donskoy and tests conducted ^s at a plant in 1951 with 2,500-cps frequency converter consisting of induction motor DAMO-350-2 and 250-kw generator VGO-250-2500, replacement ^e of 2,500 cps (standard for induction furnaces manufd in USSR) with 1,000 cps and possible use of ignitrons and mercury converters for more efficient ^L operation.

T

VAYNBerg, G. S.

AID P - 937

Subject : USSR/Electricity

Card 1/1 Pub. 27 - 6/25

Author : Vaynberg, G. S., Eng.

Title : Selection of dimensions of the induction coils and of the charge of a coreless electric induction furnace

Periodical : Elektrichestvo, 10, 29-32, 0 1954

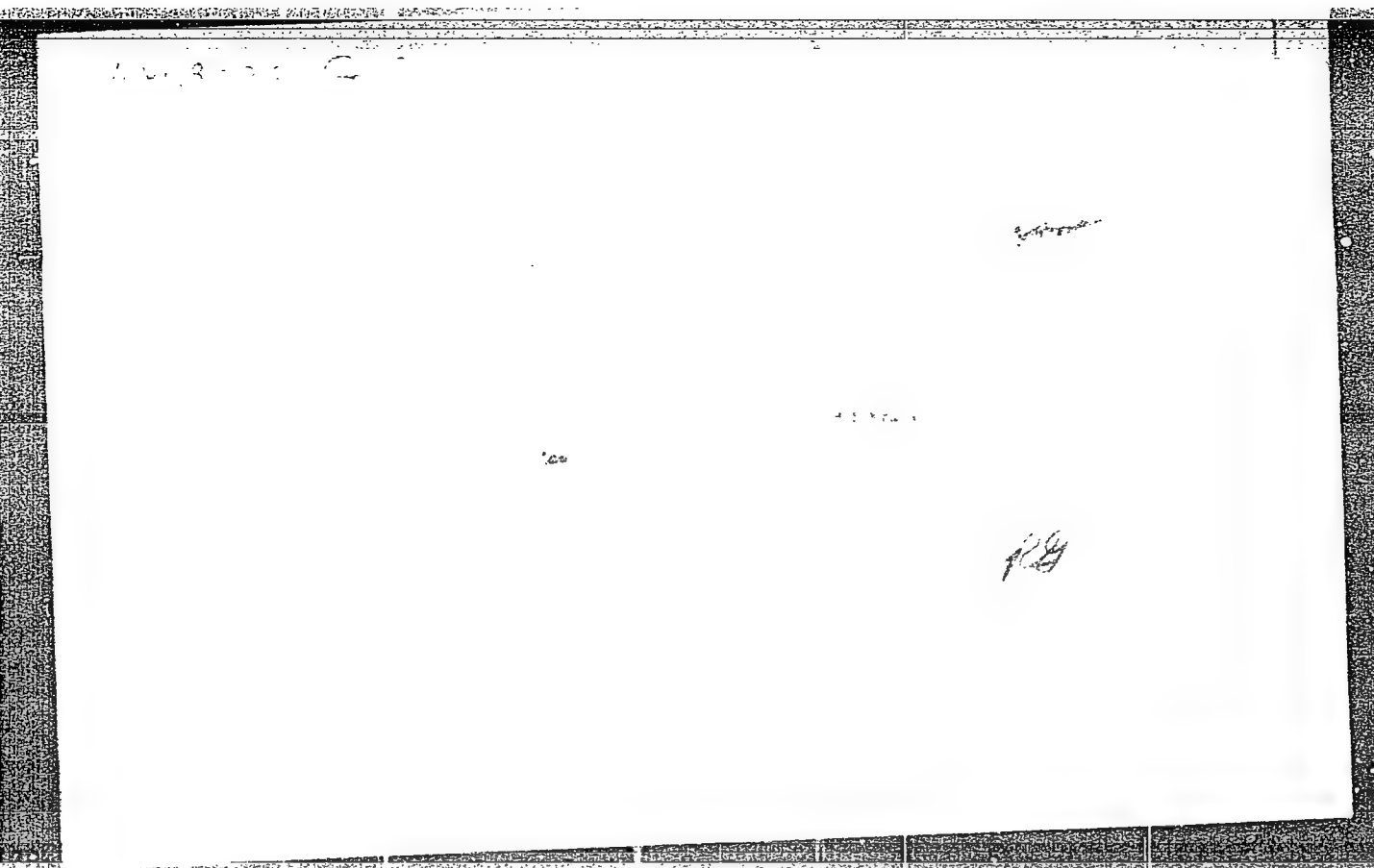
Abstract : A relation is established between geometric dimensions of the steel melting induction furnaces of 75 to 1200 kg capacity and the electric efficiency of these furnaces. The author determines the optimal ratio. Six diagrams, 2 references (1948, 1950).

Institution : Trust "Elektropech'"

Submitted : Ap 22, 1954

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CIA-RDP86-00513R001859110013-2



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PETROV, A.K.; SPERANSKIY, V.G.; KHIZHNICHENKO, A.M.; SHILYAYEV, B.A.;
DANILOV, A.K.; BORODULIN, G.M.; ZAMOTAYEV, S.P.; MARKARYANTS, A.A.;
SOLNTSEV, P.I.; SMIRNOV, Yu.D.; VAYNBERG, G.S.; OKOROKOV, N.V.;
KOLOSOV, M.I.; SEL'KIN, G.S.; MEDOVAR, B.I.; LATASH, Yu.B.;
YEFROYMOVICH, Yu.Ye.; VINOGRADOV, V.M.; SVEDE-SHVETS, N.N.;
SKOROKHOD, S.D.; KATSEVICH, L.S.; SHTROMBERG, Ya.A.; MIKHAYLOV,
O.A.; PATON, B.Ye.

Reports (brief annotations). Biul. TSNIICM no.18/19:67-68 '57.
(MIRA 11:4)

1. Zavod Dneprospetsstal' (for Speranskiy, Borodulin).
2. Chelyabinskii metallurgicheskii zavod (for Khizhnichenko).
3. Uralmashzavod (for Zamotayev).
4. Trest "Elektropech'" (for Vaynberg).
5. Moskovskii institut stali (for Okorokov).
6. TSentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii (for Sel'kin, Svede-Shvets).
7. Institut elektrosvarki AN USSR (for Paton, Medovar, Latash).
8. TSentral'naya laboratoriya avtomatiki (for Yefroymovich, Vinogradov).
9. Gissogneupor (for Skorokhod).
10. Trest "Elektropech'" (for Katsevich).
11. Tbilisskiy nauchno-issledovatel'skiy institut okhrany truda Vsesoyuznogo tsentral'nogo soveta profsoyuzov (for Shtromberg).

(Steel--Metallurgy)

137-58-6-11789

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 6, p 84 (USSR)

AUTHOR: Vaynberg, G.S.

TITLE: The Design of Vacuum Induction Furnaces for the Smelting of Steel and Special Alloys (Konstruktsiya induktsionnykh vakuumnykh elektropetchey dlya vyplavki stali i spetsial'nykh splavov)

PERIODICAL: Tr. Nauchno-tekhn. o-va chernoy metallurgii, 1957, Vol 18, pp 592-599

ABSTRACT: The Special-designs Office of the Eletropech' Trust has developed, during the past few years, designs of vacuum furnaces of 1 kg to 3 t capacity. Furnaces of up to 150-kg capacity have been developed for batch operation, furnaces of 0.5, 1 and 3 t for semi-continuous operation. The design and operation of furnaces with an inductor in the vacuum chamber has resulted in the development of a dependable insulating material permitting operation at inductor potentials of up to 1000 v, electrical heating for the hot top to reduce the shrinkage cavity in the ingot, a screw-in gland-type 500-mm seal, a device for taking samples without interfering with the vacuum, and designs for

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137-58-6-11789

The Design of Vacuum (cont.)

metering units, valves, and other parts. Following are the major considerations underlying the design of the 0.5, 1.0, and 3.0-t electric furnaces: the possibility of semi-continuous operation, a melting chamber vacuum of 10^{-2} - 10^{-3} mm Hg, which is attained by installing booster pumps having capacities of from 4500 liters/sec (0.5-ton furnace) to 15,000 liters/sec (3-ton furnace) and the required preliminary-evacuation pumps, the problems involved in handling slag, and the possible requirement of making shaped castings. Furnaces with inductors outside the vacuum space are made for laboratory work.

V.B.

1. Vacuum furnaces--Design
2. Induction heating--Applications
3. Steel--Production
4. Alloys--Production

Card 2/2

VAYNBURG, G.S., inzh. (Moskva).

Theory of apparatus for electromagnetic stirring of metal in arc
furnaces. Elektrichestvo no.2:40-46 F '58. (MIRA 11:2)
(Electric furnaces)

AUTHOR: Vaynberg, G. S., Engineer (Moscow) 105-58-5-5/28

TITLE: On Selecting the Frequency of Devices for the Electromagnetical Mixing of Metal in an Electric furnace (O vybore chastoty ustroystv dlya elektromagnitnogo peremeshivaniya metalla v elektropechi)

PERIODICAL: Elektrichestvo, 1958, Nr 5, pp. 20-24 (USSR)

ABSTRACT: Vising the same simplifications as in Reference 1, here the problem of connection between the current frequency and the magnitude of power and moment which is transmitted to the molten metal, as well as in consequence of that, the problem of rational selection of current frequency, are investigated. From the here derived formulae (3) to (7), and from the here given curves and reflections the following is determined: 1) In frequency variation the greatest moment transmitted to the molten metal is produced during operation with mean frequencies between 5 to 10 cycles dependent on the dimensions of the furnace (highest frequency in smallest furnaces). 2) The magnitude of moment, referred to 1 cm² of the stator,

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On Selecting the Frequency of Devices for the
Electromagnetical Mixing of Metal in an Electric Furnace

105-58-5-5/28

surface or of the molten metal increases according to the increase of magnetic induction and of the pole pitch. In the second paragraph the mixing speed of the molten metal and the magnitude of moment are investigated in the case of frequency variation. Although in the analytical way both of them can difficulty be determined, here the work of the devices for electromagnetical mixing is analytically investigated only based on the mentioned deductions, which result from solving the equations for the electromagnetic field of the device. It is shown that for the purpose of increasing the speed of metal that frequency is to be selected, at which the moment variation in raising the speed is unimportant, however, the magnitude of moment is greatest. The statements are illustrated by an example. It is shown that with industrial frequency the moment is practically by the 1,5- to 2-fold smaller than in the case of the most advantageous frequency calculated according to the formula (6). Summarizingly it is stated: 1) The most rational performance of these devices are those with the frequency of from 5 to 10

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On Selecting the Frequency of Devices for the 105-58-5-5/28
Electromagnetical Mixing of Metal in an Electric Furnace

cycles with an induction as high as possible on the stator surface. Here the greatest moment is transmitted to the molten metal. 2) When the mixing devices have industrial frequency and their induction on the stator surface is as high as possible the moment decreases almost by half its value. 3) When the devices have frequencies of from 0,5 to 1 cycle the magnitude of moment decreases relatively little (by 20 - 30%), however, the transformation equipment becomes more complicated. There are 3 figures and 2 references, which are Soviet.

SUBMITTED: July 13, 1957

AVAILABLE: Library of Congress

Card 3/3

1. Electric furnaces--Operation 2. Metals--Processing
3. Electromagnetic equipment--Applications 4. Frequency
--Selection

| 1ST AND 2ND ORDER | | PROCESSING AND PROPERTIES INDEX | |
|--|--|---------------------------------|--|
| VAYNBERG, G.Ya | | 21 | |
| <p>New Trend in the Practice of Determining Oxygen in Alloy Steels. G. Ya. Vaynberg. (Zavodskaya Laboratoriya, 1940, No. 1, pp. 23-25). (In Russian). The author's preliminary experiments in his investigation of methods of determining oxygen in alloy steels showed that all the metallic oxides which may be present in alloy steels can be completely, or almost completely, reduced with hydrogen at a temperature of 1250° C., heating being continued for at least 1 1/2 hr. The treatment was carried out in the presence of a "flux" consisting of a one-to-five mixture of tin and antimony in powder form. His subsequent experiments demonstrated that, to obtain consistent results, samples of the steel to be analyzed should be massive and should have a regular geometrical shape, preferably cylindrical. This eliminates errors which may be caused by variable amounts of surface oxygen in the case of comminuted samples. A number of experiments showed the applicability of the method to low- and high-alloy steels.</p> | | | |
| ASB-35A METALLURGICAL LITERATURE CLASSIFICATION | | | |
| FROM 1170110100 | | TO 1170110100 | |
| 1170110100 | | 1170110100 | |

VAYNBERG, I.A.

Cesarean section by Doerfler's technique with L.A. Gusakov's
modification. Akush. i gin. 39 no.5:142-143 S-0 '63.
(MIRA 17:8)

1. Iz akushersko-ginekologicheskogo otdeleniya (nachal'nik
I.A. Vaynberg) Artemovskoy zheleznodorozhnoy bol'nitsy (nachal'-
nik L.M. Zekhov) Donetskoy zheleznoy dorogi.

VAYNBERG, I.A.

Rare combination of ectopic pregnancy and ovarian cancer.
Akush. i gin. 34 no.5:112-113 S-O '58 (MIRA 11:10)

1. Iz ginekologicheskogo otdeleniya (nach. I.A. Vaynberg)
Ilovayskoy zheleznodorozhnoy hol'nitsy (nach. L.L. Cherenkova)
Donetskoy zheleznoy dorogi.
(PREGNANCY, EXTRAUTERINE)
(OVARIES--CANCER)

LOPATINSKIY, V.B.; VAYNBERG, I.A.

Tetanus in a 38-week pregnancy. Akush. 1 gzn. 35 no.3:116-117
My-Je '59. (MIRA 12:8)

1. Iz khirurgicheskogo otdeleniya (zav. V.B.Lopatinskiy) bol'-
nitsy (nach. L.L.Cherenkova) stantsii Ilovayskoye Donetskoy
zheleznoy dorogi.

(PREGNANCY, compl.

tetanus in 38-week pregn. (Rus))

(TETANUS, in pregn.

in 38 week pregn. (Rus))

BELOZERSKIY, S.S., inzh.; VAYNBERG, I.B., inzh.; SOKOLIN, G.F., inzh.;
DAVIDENKOV, A.K., inzh.

Using chromatographs. Mekh. i avtom. proizv. 19 no.4:41-42
Ap '65. (MIRA 18:6)

3h781
S/118/62/000/003/004/005
D221/D302

5.1500 (2150 5419)
AUTHORS: Vaynberg, I.B., and Sokolin, Sh.L., Engineers
TITLE: Instruments for the automation of oil refineries
PERIODICAL: Mekhanizatsiya i avtomatizatsiya proizvodstva, no. 3,
1962, 37 - 40

TEXT: The special design office for automation of oil refining has developed several special instruments. The ДП-320 (DP-320) transducer measures pressure drop up to 50 kg/cm² with a static pressure of 320 kg/cm². Use of thick-walled diaphragms permits measurement of pressure drop in gases with a high content of hydrogen. The transducer operates on the principle of force compensation. The transducer ДИУУ (DIUU) is applied for measuring liquid levels at pressures of 320 and 700 kg/cm². It is formed by a chamber with a weight suspended on a spring. The weight carries a core travelling in a nonmagnetic austenitic steel sleeve. The level difference produces a shift of core in respect of the induction coil. For remote control of liquid level the electric indicator УЭД-2 (UED-2) is

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Instruments for the automation of ...

S/118/62/000/003/004/005
D221/D302

used which operates at atmospheric or low (up to 6 kg/cm²) pressures and in vacuum. Its operation is based on the servo-system. The float actuates a reversible motor which rotates the drive roller, drum of the level counter and the rotation of the transmitting sel-syn. The unit is made in an explosion-proof design. The level indicator УЭД-3 (UED-3) with a coded telemetering system can be connected to 99 points by a selector switch. The main design is similar to UED-2. A prototype series of these instruments is installed in storage compounds at the Novourinsk and Odessa refineries. The flowmeter for remote indications is particularly suitable for liquid naphthalene at 120°C. The transducer coil is placed inside the flow, and connected to a differential transformer instrument. The unit comprises an amplifier and a mechanism with a reversible motor actuating the core of the indicating and recording coils. The amplified voltage is proportional to the displacement of the core, whereas its phase is a function of core travel from its mean position. The meter is provided with a steam jacket to prevent the crystallization of the product. The valve KB (KV) for viscous media has an angular shape and contains a single poppet. The liquid flow

Card 2/3

Instruments for the automation of ...

S/118/62/000/003/004/005
D221/D302

ensures the balance of the valve as well as the cleaning of the chambers. The flow is proportional to the plunger motion. The displacement of the valve depends on the change of pressure in the bellows of the position relay. The use of these valves at Moscow oil refinery ensured the automatic control of the level of the cracking residue. There are 5 figures.

X

Card 3/3

VAYNBERG, I.M.

Piston Rings

Ways of increasing the durability of chromiumplated piston rings, Vest. mash.,

$\frac{1}{2}$ 32, no. 1, 1952.

Monthly List of Russian Accessions, Library of Congress, Unclassified, October 1952

VAYNEBERG, I. S.

Data on the semeiology of disorders in the hypothalamus region

Leningrad, GIDUV, 1940. 215 p.

VAYNBERG, L. I.

Peritonitis

Rheumatoid myositis as a cause of diagnostic error in acute peritonitis. Khirurgia no. 2, 1952.

9. Monthly List of Russian Accessions, Library of Congress, August 1952, 2 Unclassified.

VAYNBERG, L.I., kand.med.nauk

Epidermoid cysts of the sacrococcygeal region. Khirurgiia 3/4 no.8
136-139 Ag '58 (MIRA 11:9)

1. Iz kliniki khirurgii detskogo vozrasta (zav. - prof. A.P. Shurinok)
Kiyevskogo ordena trudovogo Krasnogo Znameni meditsinskogo instituta
imeni akad. A.A. Bogomol'tsa (dir. - dots. I.P. Alekseyenko) i
khirurgicheskogo otdeleniya bol'nitsy imeni M.I. Kalinina (glavnyy
vrach V.A. Udintseva).

(SACROCOCYGEAL REGION, cysts
epidermoid (Rus))

VAYNBERG, M., kand. tekhn. nauk.

Arranging apartment house facilities. Zhil.-kom. khoz, 8 no.2:5-6
'58. (MIRA 11:2)

(Apartment houses)

GERSHKOVICH, Zh.[Herscovici, G.]; DUVALMA, M.; MEROYU, Ye.[Meroiu, E.];
SMORZHEVSKAYA, M.; VAYNBERG, M.; KORLETYANU, Ye.[Corleteanu, E.]

Preparation of isoprene from dimethyldioxane. Part 1: Role of
a catalyst and of a carrier. Zhur. ob. khim. 32 no.12:3987-3990
D '62. (MIRA 16:1)

1. Khimicheskiy issledovatel'skiy institut, Bukharest.

(Isoprene) (Dioxane) (Catalysts)

GERSHKOVICH, Zh.[Herscovici, G.]; DUVALMA, M.; MEROYU, Ye.[Merou, E.];
SFINTESCU, K.[Sfintescu, C.]; KORLETYANU, Ye.[Corleteanu, E.];
VAYNBERG, M.; SMORZHEVSKAYA, M.

Preparation of isoprene from dimethyldioxane. Part 3:Acidity
and activity of a cracking catalyst. Zhur. ob. khim. 32 no.12:
3992-3997 D '62. (MIRA 16:1)

1. Khimicheskiy issledovatel'skiy institut, Bukharest.

(Isoprene) (Dioxane) (Catalysts)

VAYNBERG, M., kand. tekhn. nauk; KRASHENINNIKOVA, Ye., kand.
arkhitektury

Practices in determining the most economical number of
stories for buildings. Zhil. stroi. no. 10: 23 '64. (MIRA 18:4)

BRENMAN, A.; GERSHKOVICH, Zh.; GERTSOV, A.M.; VAYNBERG, M.

Formation of the catalyst under conditions of the hydroformylation reaction. Zhur. prikl. khim. 34 no.2:454-455 F '61. (MIRA 14:2)

1. Khimicheskiy issledovatel'skiy institut, Bukharest.
(Oxo process) (Cobalt carbonyl)

WAYNERS, K.

Telecommunication

Results of creative cooperation, Sov. sviaz. No. 2, 1953.

9. Monthly List of Russian Accessions, Library of Congress, May 1953. Unclassified.

AYZENGENDLER, P.G.; VAYNBERG, M.M.

Theory of branching of solutions to nonlinear equations in the
multidimensional case. Dokl. AN SSSR 163 no.3:543-546 J1 '65.
(MIRA 18:7)

1. Moskovskiy oblastnoy pedagogicheskiy institut im. N.K.Krupskoy.
Submitted March 19, 1965.

VAYNBERG, M., kand.tekhn.nauk

Introduction of progressive city-cleaning methods in Kuybyshev.
Zhil.-kom. khoz. 10 no.10:12-13 '60. (MIRA 13:10)
(Kuybyshev--Refuse and refuse disposal)

GULYAYEV, N., kand.tekhn.nauk; VAYNBERG, M., kand.tekhn.nauk

Constructing refuse-sorting plants. Zhil.-kom.khoz. 9
no.11:13-14 '59. (MIRA 13:2)
(Refuse and refuse disposal)

VAYNBERG, M.

The institute renders assistance to the industry. Radio no.2:10
F '62. (MIRA 15:1)
(Telecommunication)

S/079/62/032/012/004/008
D424/D307

AUTHORS: Gershkovich, Zh., Duvalma, M., Meruyu, Ye., Smorzhevskaya, M., Vaynberg, M., and Korletyanu, Ye.

TITLE: Production of isoprene from dimethyldioxan. I. The role of catalyst and support

PERIODICAL: Zhurnal obshchey khimii, v. 32, no. 12, 1962, 3987-3990

TEXT: In connection with work carried out at the authors' Institute in Bucharest on the production of isoprene from isobutylene and formaldehyde via 4,4-dimethyl-1,3-dioxan (DMD), the effect of the composition of the catalyst for the vapor-phase conversion of DMD to isoprene on its selectivity, isomerizing effect, etc. has been studied. Standard conditions found to be optimal in preliminary experiments were used, namely: 270°C and a space velocity of feed of DMD of 0.4 hr⁻¹. The highest activity was possessed by a catalyst consisting of acid calcium phosphate on a silica/5% alumina support, the nature of the support being important. With this cata-

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D424/D307

Production of isoprene ...

lyst, the selectivity fell as the temperature was increased from 150 to 350°C but the maximum total conversion (~65%) was obtained at ~300°C, the selectivity then being of the order of 85%. By-products found (by gas chromatography) included isobutylene, 2-methylbut-2-ene, methyldihydropyran, 2-methylbutan-1-ol, isovaleraldehyde, and dimers and trimers of isoprene. The fact that the support alone had a small catalytic activity due to its Lewis acid sites and leading mainly to isobutylene is considered to show that the activity of the calcium phosphate catalyst depends on the presence of Brønsted acid sites. The catalyst is not appreciably affected by the usual impurities in DiD but is poisoned by sulfur (mercaptans). It can also be used for the production of other dienes, e.g. 2-phenylbutadiene, by analogous reactions. There are 5 figures.

ASSOCIATION: Khimicheskiy issledovatel'skiy institut, Bucharest
(Chemical Research Institute, Bucharest)

SUBMITTED: February 24, 1961

Card 2/2

VAYNBERG, M., kand.tekhn.nauk; LAKHTIN, V., kand. arkhitektury

Evaluation of methods of distribution housing construction. Zhil.
stroit. no.12:2-3 '61. (MIRA 15:2)
(Chelyabinsk--Construction industry) (Apartment houses)

1. 01.

VAYNBERG, M. M.

O regul'yornoy zamknutosti toplogicheskikh prostranstv. DAN, 31 (1941),
523-524.

SO: Mathematics in the USSR, 1917-1947
edited by Kurosh, A.G.,
Markushevich, A.I.,
Rashevskiy, P.K.
Moscow-Leningrad, 1948

VAYNBERG, M. M.

Sushchestvovaniye sobstvennoy funktsii u odnogo klасса nelineynykh
interral'nykh uravneniy. DAN, 46 (1945), 51-54.

SO: Mathematics in the USSR, 1917-1947
edited by Kurosh, A.G.,
Markushevich, A.I.,
Rashevskiy, P.K.
Moscow-Leningrad, 1948

VAYNBERG, M. M.

Vainberg M. M. On the characteristic values of a class of

$$L(x) = \int_0^x f(t) dt$$

with $x=0$ for a certain bounded domain R in Euclidean

WERNBERG, M. M.

$u = (u_1, \dots, u_n)$, $g_i(u, x) = (\partial/\partial u_i)G(u, x)$, $g_i(0, x) = G(u, 0)$, where x, y are in \mathbb{R}^n . It is also proved that there exists a system of solutions of (1), tending to 0 (according to the norm) if the $K(x, y)$ are positive, symmetric, B is a bounded domain in a Euclidean space. The set of $K(x, y)$ is such that $K(x, y) \geq 0$ while the real x, u, y

solution. It is proved that, in the case of solutions of (1), tending to 0, if the $K(x, y)$ are symmetric, positive, bounded, measurable, while the real functions of real arguments $g_i(u, y)$ are (in a neighborhood of $u=0$) measurable over B in y , continuous in u and $|g_i(u, y)| \leq a_i(y)$.

Smul

Source: Mathematical Reviews,

Vol 10 No. 7

VAYNBERG, M. M.

$$(1) \quad u_1(x) = \int_B K_1(x, y) g_1(u_1(y), \dots, u_n(y), y) dy.$$

belonging to L_1 and satisfying (1) or (2) is continuous in (u_1, \dots, u_n) , is measurable in x (in B) and satisfies $\int_B |u_1(x) - u_2(x)| dx = \int_B |f_1(x) - f_2(x)| dx$.

VAYNBERG, M. M.

21325

VAYNBERG, M. M. K voprosu o sushestvovanii resheniy u odnogo klasse
nedineynykh integral'nykh uravneniy. Trudy Gos. Okeanogr, IN-FA, Vyp. II,
1949, S. 61-70 - Bibliogr: S. 70.

SO: Ietopis' Zhurnal'nykh Statey, No. 29, Moskva, 1949.

VAYNBERG, M. M.

Vainberg, M. M. Existence theorems for the character values of a class of systems of nonlinear integral equations. Mat. Sbornik N.S. 20(68), 365-394 (Russian)

The author studies the system

$$(1) \quad u_n(x) = \int_B K_n(x, y) g_n(u_1(y), \dots, u_n(y)) dy,$$

$n = 1, \dots, N$; the kernels $K_n(x, y)$ are symmetric and positive; the $g_n(u, x)$ are continuous in $u = (u_1, \dots, u_N)$ for x fixed in the bounded domain (in m -space) B and variable in x (in B) for n fixed, and $g_n(x, x) = 0$; $g(0, x) = G(0, x) = 0$. The function

$$\psi(x) = (\psi_1(x), \dots, \psi_N(x)), \quad \psi_n(x) = \int_B K_n(x, y) dy$$

and of nonzero norm is termed a characteristic function of (1) if ψ satisfies (1) for some real values $\mu^{(0)} = (\mu_1^{(0)}, \dots, \mu_N^{(0)})$, for which (1) has a solution c.v. (characteristic value). Under various additional hypotheses on K_n and g_n it is shown that there exists a denumerable infinity of c.v.'s of (1) in $L_2(B)$. The theorem asserts that, if the aggregate of functions defines a continuous operator h_n in $L_2(B)$, and

$$0 < \iint_B K_n(x, y) dx dy$$

then (1) has at least a denumerable infinity of c.v.'s in $L_2(B)$, tending to zero according to norm. The continuity of the operator h_n are examined in some cases. The case of bounded kernels is also considered.

W. J. Trizianky (Urbana)

Source: Mathematical Reviews.

Vol 12 No 1

VAYNBERG, M.M.

Vaynberg, M. M. On the continuity of some operators of special type. Doklady Akad. Nauk SSSR (N.S.) 73, 253-255 (1970). (Russian)

Let $f(u, x)$ be defined for u real and for $x \in B$, a measurable subset of Euclidean n -space, and assume f is continuous for u fixed, and measurable for u fixed. If $u(x)$ is defined on B ,

theorem on integral equations. Assume (1) the function $f(u, x)$ is continuous in u and measurable in x , and

represent a vector u , $u \in \mathbb{R}^n$, and $x \in B$.

Source: Mathematical Reviews,

Vol. 1, No. 2.

(som) *[handwritten signature]*

VAYNBERG, M.M.

Vainberg, M. M. On the characteristic elements of a class of non-linear operators. Doklady Akad. Nauk SSSR (N.S.) 78, 649 (1971) (Russian)

The methods of this paper are variation-topological; the proof is entirely self-contained; the terminology is that of Nemitskiĭ [1] (see also [2]).

(1) Let L_1 and L_2 be linear spaces generated by $df(x, h) = (F(x), h)$ (Fréchet differential of F at x), $F(x)$ is w.c. (weakly continuous), for $x \in B$, $F(x)$ is necessary and sufficient that $df(x, h) = 0$ for $h \in L_2$ implies $x = 0$.

Consider the problem: (1) is w.c. and has for $\|x\| \leq \delta$ the properties: (2) $F(x) = 0$ implies $x = 0$ and $f(x) = 0$ (with $\|f\| = 0$), (3) $F(x) = 0$ implies $x = 0$ (of f), is completely continuous in L_1 , while $\|f(x)\| = 0$ implies $x = 0$.

(11) Under (1) - (3) the equation $F(x) = \lambda x$ has in every sphere $\|x\| \leq r$ a denumerable infinity of geometrically distinct solutions.

(3) For summation of characteristic kernel $K(x, y) \in L_2$ (in (x, y)) has certain characteristic values; (4) $g(x, x)$, with $g(x, x) \in L_1$, is continuous for real u for $x \in B$ (B a bounded set in L_1) and (for $u \neq 0$) $g(u, x) \neq 0$ almost everywhere.

Under (3), (4) the equation $\mu(x) = \lambda x$ has for $0 < \lambda \leq a$ at least a denumerable infinity of characteristic functions in L_1 ; their explicit representation is given.

W. J. Trjuszynski.

WJ

Source: Mathematical Reviews,

Vol 12 No. 9.

184T69

USSR/Mathematics - Functionals

11 Jun 51

"Weak Continuity of Functionals and Their Gradients," M. M. Vaynberg, Moscow Oblast Pedagogic Inst

"Dok Ak Nauk SSSR" Vol LXXVIII No 5, pp 841-844

Properties of functionals (min, max, and points of minmax) and their gradients are important in quant investigation of variational problems in infinite spaces, studied by E. S. Tsitlanadze ("Dok Ak Nauk SSSR" Vol LIII, No 4, 1946). Problem discussed here was first brought up by I. A. Lyusternik in connection with the works of

184T69

USSR/Mathematics - Functionals (Contd) 11 Jun 51

Tsitlanadze. Problem proposed is: Of what sort is the class of nonlinear operators for which weak continuity follows from complete continuity? Submitted by Acad S. L. Sobolev 17 Apr 51.

184T69

VAYNBERG, M. M.

184T77

USSR/Mathematics - Nonlinear Integral 21 Jun 51
Equations

"Existence of Eigenfunctions Among Nonlinear Integral Equations With Nonpositive Kernels," M. M. Vaynberg, Moscow Oblast Pedagogic Inst

"Dok Ak Nauk SSSR" Vol LXXVIII, No 6, pp 1077-1080

Shows variational method can be modified so that it encompasses even certain classes with nonpos kernels -- where eigenvalues of the kernel $K(x,y)$ possess finite number of positives. Cf. Lichtenstein, "Vorlesungen uber einige Klassen nichtlinearer Integralgleichungen," 1931, pp 140-156. Submitted 20 Apr 51 by Acad S. L. Sobolev.

184T77

Yamberg, M. M. On the variational theory of characters.

1964

3

VAYNBERG, M. M.

On the question of variation theory of the Eigen values for non-linear integral equations, by M. M. VAYNBERG. Uspechi mat. Nauk 7, No. 1 (47), 144-146 (1952).

VAINBERG, M.M.

Vainberg, M. M. On some variational principles in the theory of operator equations. Uspehi Matem. Nauk (N.S.) 7, no. 2(48), 197-200 (1952). (Russian)

The author observes that a theorem of Lyusternik [Mat. Sbornik 41, 390-401 (1934)] implies the following result of Golomb [Math. Z. 39, 45-75 (1934)]: If in a real Hilbert space H there is given an operator $F(x) = \text{grad } f(x)$ and also a completely continuous self-adjoint operator Ax ; then the equation $\mu x = A^*F(x)$ has at least two different solutions in each sphere $\|x\| \leq r$, corresponding to real eigen-values μ . He also deduces connections with the work of Rothe [Ann. of Math. 49, 265-278 (1948); these Rev. 10, 461].

J. M. Danskin (Santa Monica, Calif.)

R

MATHEMATICAL REVIEWS (Unclassified)
Vol. 14, No. 1, January 1953, pp. 1-120

USSR/Mathematics - Functionals

May/Jun 52

"The Differential and Gradient of Functionals,"
M. M. Vaynberg

"Uspekhi Matemat Nauk" Vol VII, No 3 (49), pp 139-143

Investigates for functionals the problem concerning the linearity of Gateaux' differential and gives the necessary conditions that Gateaux' differential be also Frechet's differential, such investigation permitting one to introduce the concept of the gradient of a functional not from Frechet's but Gateaux' differential, which is an advantage since Gateaux' linear differential can exist even when Frechet's cannot; in this case the demonstration of existence and

218T70

USSR/Mathematics - Functionals (Contd) May/Jun 52

the direct calculation is easier than in Frechet's case. The results obtained here show that all previous results of the author are preserved if the gradient concept proceeds from Gateaux'. Submitted 4 Feb 52.

218T70

VAYNBERG, M. M.

VAYNBERG, M. M.

USSR/Mathematics - Linear Spaces, Differential Calculus Jul/Aug 52

"Certain Problems of the Differential Calculus in Linear Spaces," M. M. Vaynberg

"Uspekhi Matemat Nauk" Vol VII, No 4 (50), pp 55-102

Discusses continuous operators and functionals; differential, deriv and gradient of a functional; potential operators; and examples of a potential operator operating from a space L_p to space L_q (where $p+q=pq$). Cites M. K. Gavurin, V. R. Gantmakher, V. L. Shmul'yan, M. A. Krasnosel'skiy, M. Lavrent'yev, L. Lyusternik, Zh. Leray, Yu. Shauder, V. I. Sobolev, I. P. Natanson, G. A. Sukhomlinov, and E. S. Tsitlanadze in similar works.

225T58

VAYNBERG, M. M.

USSR/Mathematics - Nonlinear Integral

Equations, Eigenvalues Jan/Feb 52

"Contribution to the Problem Concerning the Variational Theory of Eigenvalues for Nonlinear Integral Equations," M. M. Vaynberg, Moscow

"Matemat Sbor" Vol XXX (72), No 1, pp 3-10

Supplements results obtained earlier by Vaynberg ("Theorems Governing the Existence of Eigenvalues for One Class of Systems of Nonlinear Integral Equations," *ibid.* Vol XXVI, (68), 1950, 365-394). Indicates another method for solving the problem concerning eigenvalues for nonlinear integral eqs.

203741

USSR/Mathematics - Nonlinear Integral

Equations, Eigenvalues (Contd) Jan/Feb 52

Considers weak continuity of functionals $f(x)$, of eigenvalues, etc. Cf. E. H. Rothe, "Completely Continuous Scalars and Variational Methods," *Annals of Math*, 49, No 2, 1948, 265-278. Submitted 15 Nov 1950. Sub-

203741

VAYNBERG, M. M.

USSR/Mathematics - Modern Algebra, Banach Space 21 Apr 52

"Fixed (Immovable) Directions of Certain Completely Continuous Operators," M. M. Vaynberg

"Dok Ak Nauk SSSR" Vol LXXXIII, No 6, pp 785-788

Gives another method for demonstrating the existence of fixed directions which uses topological methods of functional analysis and which is applicable for a wide class of infinite-dimensional spaces (spaces of the Banach type), whose separableness is not assumed. Submitted by Acad S. L. Sobolev 27 Feb 52.

223T63

VAYNBERG, M. M.

"Fixed Directions of Products of Certain Operators," Dokl. AN SSSR, 85, No.2, pp 261-3, 1952

Author establishes, by a variational method, the existence of fixed directions of operators of the form $BF(x)$, where B is a self-adjoint completely continuous operator acting in a real Hilbert space H and F is a potential operator given in H . An operator operating from a Banach space E on adjoint space E' is called potential if it is the gradient of a certain functional assigned in E . Presented by Acad. S. L. Sobolev 24 Apr 52.

252T62

1. VAYNBERG, M.M.
2. USSR (600)
4. Eigenfunctions
7. Existence of eigenfunctions in non-linear integral operators with non-positive kernels and in the product of a self-conjugate and potential operator, M.M. Vaynberg, Mat. sbor. 32 no. 3, 1953.

Demonstrates a theorem on the existence of solutions of the operator eq $x-BF(x)$, Gives a complete exposition of results which were only briefly expounded by the author in two short reports ("Existence of Eigenfunctions of Non-linear Integral Equations with Nonpositive Kernels," Dokl. AN SSSR, 78, No.6, pp 1077-1089, 1951; and "Variational Theory of Eigenvalues of Nonlinear Integral Equations," ibid., 80, No.3, pp 309-311, 1951). Submitted 14 Jul 52.

250T8

9. Monthly List of Russian Accessions, Library of Congress, APRIL 1953, Uncl.

VAYNBERG, M. M.

USSR/Mathematics - Nonlinear Integrals

11 Sep 53

"The Structure of a Certain Operator," M. M. Vaynberg

DAN SSSR, Vol 92, No 2, pp 213-216

Considers the problem of whether a given operator h generated by a real function $f(u, x)$ depends upon the structural properties of $f(u, x)$, where $f(u, x)$ is defined for all real u and for all x in the measurable set B of Euclidean space s of dimensions s by the equality $hu = f(u(x), x)$. Notes that h was studied earlier by V. V. Nemytskiy (Matem Sbor. 41,

269T74

438 (1934)), by the author in 1949, and by M. A. Krasnosel'skiy (Ukrain Matem Zhurn. 2, No 3, 1951). Completes the investigation of the continuity of h for an extensive class of functional spaces, and shows that the necessary and sufficient criterion of continuity. Presented by Acad S. L. Sobolev 13 Jul 53.

Valnberg, M. M. On solvability of certain operator equations. Doklady Akad. Nauk SSSR (N.S.) 92, 457-460 (1953). (Russian)

The author continues his earlier work on non-linear equations [same Doklady (N.S.) 73, 253-255 (1950); 92, 213-216 (1953); Uspehi Matem. Nauk (N.S.) 7, no. 4(56), 55-102 (1952); these Rev. 12, 111; 15, 439; 14, 384]. The principal results are the following. Theorem 1. In a real Hilbert space H let B be a positive, self-conjugate linear operator and let $F(x) = \text{grad } f(x)$, where f satisfies the condition $2f(x) \leq a_1(x, x) + a_2(x, x)^\gamma + a_3$, where a_2 and a_3 are positive numbers, $0 < \gamma < 1$, and $0 < a_1 \|B\| < 1$. Suppose further that (a) f is continuous and B is compact or (b) f is weakly upper semi-continuous. Then the equation $x = BF(x)$ has a solution. Theorem 2. Suppose: (1) B is self-conjugate in H , the positive part of the spectrum of B is in an interval (m, n) , $m > 0$, and the range of $E_n - E_m$ is finite-dimensional, where $\{E_t\}$ is the spectral resolution of B ; (2) $F(x) = \text{grad } f(x)$, where $f(x) \geq (x, x)/m + a_2(x, x)^\gamma + a_3$, where a_2 and a_3 are positive numbers and $0 < \gamma < 1$; and (3) (a) above or (b') f is weakly lower semicontinuous. Then $x = BF(x)$ has a solution. An application to non-linear integral equations is discussed in which are needed results of the first references above. M. M. Day (Urbana, Ill.).

Mathematical Review
June 1954
Analysis

10-7-54
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VAKHANGOVA, I. N. --

"Potential Operators and the Variational Theory of Non-linear Operator Equations." Dr. Phys.-Math. Sci., Moscow State Univ. Lenin State U named M. V. Lomonosov, 12 Nov 54. (VII, 28 Oct 54)

Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (10)

50: Sum. No. 461, 5 May 55

VAINBERG, M.M.

Variational theory of eigenfunctions of nonlinear integral and
other operators. Trudy Mosk.mat.ob-va 3:375-406 '54. (MLRA 7:7)
(Eigenfunctions) (Operators (Mathematics)) (Integral equa-
tions)

VAYNBERG, M. M.

USSR /Mathematics - Nonlinear Operators

Card 1/1

Author : Vaynberg, M. M.

Title : Hyperboloids and the conditional extremum of certain functionals in Hilbert space

Periodical : Usp. mat. nauk, 9, No 2(60), 105-112, 1954

Abstract : In the investigation of certain problems of the theory of nonlinear operator equations it is necessary to find the sufficient conditions for the existence of the conditional extremum of the functional $\phi(x) = f(Ax)$, where $f(x)$ is a differentiable functional and A is linear operator in a real Hilbert space H . Here the author gives the sufficient conditions for the existence of the conditional extremum of functional $\phi(x)$ relative unbounded manifolds, hyperboloids generated by A . These concepts, to which certain problems of nonlinear analysis reduce, are also connected with the investigations of L. S. Pontryagin, M. G. Kreyn, M. A. Rutman, and I. S. Iokhviotov.

Submitted : April 1, 1953

VAINBERG, M. M.

Vainberg, M. M. Topological methods of investigation of a problem on eigenfunctions of nonlinear integral equations. Moskov Oblast Pedagog Inst Uch Zap. Trudy Kafedr Mat 20 (1954) 37-57 (Russian). This paper deals with the existence of nontrivial solutions for

$$(1) \quad u(x) = \lambda \int_B \cdots \int_B K(x; y_1, y_2, \dots, y_n) \times g(u(y_1), \dots, u(y_n); y_1, \dots, y_n) dy_1 \cdots dy_n$$

and similar equations when $g(0, \dots, 0; y_1, \dots, y_n) = 0$

was proved by Krasnoselsky (1956). If the completely continuous operator $F(x)$ with domain and range in the cone K of a Banach space satisfies $\|F(x)\| \geq \lambda \|x\|$ for $x \in K$ and $\|x\| = r$, then there exist $x_0 \in K$, $\|x_0\| = r$ and $\lambda_0 > 0$ such that $F(x_0) = \lambda_0 x_0$. By its use the existence of nontrivial solutions $u(x)$ of (1) in C , L_1 and L_p ($p > 1$) is proved under various hypotheses on K and g . M. Golomb (Lafayette, Ind.).

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VAYNBERG, M.M.

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VANNBERG, M.M.

VAYNBERG, M.N.

Vainberg, M. N. Potential operators and the variational
theory of nonlinear operator equations. Uspehi Mat.
16 (1955) 223-227 (Russian)

1 - F/W

VAYNBERG, M. M.

USSR/ Mathematics - quadratic forms

Card 1/1 Pub. 22 - 1/49

Authors : Vaynberg, M. M.

Title : About some properties of the quadratic forms in the spaces L^p ($1 < p \leq 2$)

Periodical : Dok. AN SSSR 100/5, 845-848, Feb 11, 1955

Abstract : The quadratic form $J(u, u)$ of the L^p ($1 < p \leq 2$) space is analyzed. Its properties are established (in three theorems and one lemma), especially those which may play an important role in the analysis of the operator A or the product of the operator A and the operator F . The operator A is a linear operator which transforms every limited set of the L^p space into a compact set of the L^p space ($p \geq 2, p' + q' = 1$). The operator F is a non-linear potential operator acting from the space U in the space L^p . Seven USSR references (1941-1953).

Institution : Moscow Regional Pedagogical Institute

Presented by: Academician S. L. Sobolev, December 3, 1954

"APPROVED FOR RELEASE: 08/31/2001

CIA-RDP86-00513R001859110013-2

APPROVED FOR RELEASE: 08/31/2001

CIA-RDP86-00513R001859110013-2"

VAYNBERG, M.M. (Moskva)

On the eigen elements of odd potential operators in Hilbert space.
Mat.sbor. 38(80) no.1:3-22 Ja '56. (MLBA 9:5)
(Spaces, Generalized) (Operators (Mathematics))(Eigenfunctions)

VAYNBERG, M.M.

Elementary proof of one Liusternik's theorem on hyperboloids
in Hilbert space. Uch. zap. MOPI 39 no.3:27-32 '56. (MLBA 10:4)
(Hyperboloid) (Functional analysis)

VAYNBERG, M.M.

Gato's and Frechet's derivatives. Uch. zap. MOPI 39 no.3:33-50
'56. (MLBA 10:4)

(Functional analysis)

VAYNBERG, M.M.

Correction of the article "Uryson's integral equation". Uch. zap.
MOPI 39 no.3:131-132 '56. (MLRA 10:4)
(Integral equations)

VAYNBURG, " ".

KOVNER, Semen Samsonovich, professor; GINZBURG, L.N., retsenzent; VAYNBURG,
M.M., retsenzent; ARKHANGEL'SKIY, S.S., redaktor; KOGAN, V.V.,
tekhnicheskii redaktor

[Mathematical methods of studying the movement of fibers in the
process of drafting] Matematicheskie metody issledovaniia dvizheniia
volokon v protsesse vytiagivaniia. Moskva, Gos.n nauchno-tekhn.
izd-vo lit-ry po legkoi promyshl.. 1957. 279 p. (MIRA 10:9)

1. Moskovskii tekstil'nyi institut (for Kovner)
(Spinning)

VAYNBERG, M.M.

SUBJECT USSR/MATHEMATICS/Functional analysis CARD 1/2 PG - 803
 AUTHOR VAINBERG M.M.
 TITLE Some questions of functional analysis and variation methods
 for the investigation of non-linear equations.
 PERIODICAL Uspechi mat.Nauk 12, 1, 162-165 (1957)
 reviewed 6/1957

In a very indistinct manner the author gives some stange and partially well-known own results (Uspechi mat.Nauk 7, 4, 55-102 (1952)) on potential operators as auxiliary means for existence proofs for non-linear equations; e.g. in order that a potential operator being defined in the Banach space with a weakly compact sphere, maps every weakly convergent sequence into a strongly convergent sequence, it is necessary and sufficient that the operator is compact or uniformly continuous.

Furthermore the author formulates two theorems on conditionally critical points with respect to hyperboloids. A point x which belongs to the manifold $\varphi(x) = c = \text{const}$ is called a conditionally critical point of the functional $f(x)$ with respect to $\varphi(x) = c$ if

$$\text{grad } f(x_0) = \mu \text{grad } \varphi(x_0)$$

μ - a certain number.

If the real Hilbert space H is an orthogonal sum of the subspaces H_1 and H_2

Uspechi mat.Nauk 12, 1, 162-165 (1957)

CARD 2/2

PG - 803

and if P_1 and P_2 are projectors of H onto H_1 and H_2 , respectively, then the manifold

$$(\|P_1 x\|^2 - \|P_2 x\|^2)^{1/2} = c > 0$$

is called a hyperboloid in H .

Theorem: Let $f(x)$ be a real functional in H and $f(x)$ be continuous in the zero of H . Let $F(x) = \text{grad } f(x)$ and let it satisfy the following conditions:

1. In every point x of a sphere $D(\|x\| \leq a)$ let

$$(DF(x, h), h) \geq 0,$$

where $DF(x, h)$ is the linear differential of Gateaux.

2. For the points $x \in V_0 \cap D$ let

$$(DF(x, h), h) > 0,$$

where V_0 is the domain with $(\|P_1 x\|^2 - \|P_2 x\|^2)^{1/2} \geq 0$.

Then there exists an $r > 0$ such that on every hyperboloid with $c \leq r$ there lies at least one conditional extremal point of the functional $f(x)$.

VAYNBERG, M.M.

Positive solutions of certain nonlinear integral equations.
Uch. zap. MOPI 57 no.4:61-72 '57.

(MIRA 11:6)

(Integral equations)

AUTHOR: Vaynberg, M.M., Engel'son, Ya.L. (Moscow-Riga) SOV/39-45-4-1/7

TITLE: On the Conditional Extremum of Functionals in Linear Topological Spaces (Ob uslovnom ekstremume funktsionalov v lineynykh topologicheskikh prostranstvakh)

PERIODICAL: Matematicheskiiy sbornik, 1958, Vol 45, Nr 4, pp 417-422 (USSR)

ABSTRACT: Lyusternik [Ref 1] has shown that if the real functionals $f(x)$ and $\varphi(x)$ defined in the real Banach space are differentiable according to Frechet and if x_0 is an extremal point of $f(x)$ with respect to the manifold $\varphi(x) = \varphi(x_0)$, where $\|\text{grad } \varphi(x_0)\| > 0$, then between the gradients there exists the relation $\text{grad } f(x_0) = \mu \text{grad } \varphi(x_0)$, $\mu = \text{const.}$

In the present paper the authors show with the aid of the methods elaborated by Lyusternik, that this theorem is also valid in linear topological spaces.

There are 7 Soviet references.

SUBMITTED: October 8, 1956

1. Topology 2. Functions - Theory

Card 1/1

20-120-5-3/67

AUTHOR: ~~Veynberg, M.M.~~, Shragin, I.V.

TITLE: The Operator of Nemytskiy and its Potential in Orlicz-Spaces
(Operator Nemytskogo i yego potentsial v prostranstvakh Orlicha)

PERIODICAL: Doklady Akademii nauk SSSR, Vol 120, Nr 5, pp 941-944 (USSR) 1958

ABSTRACT: The Nemytskiy operator h and its potential f , already investigated for several times by one of the authors [Ref 1,2,3] (especially in connection with the nonlinear integral equations of the type of Hammerstein) are considered in the Orlicz-spaces generalized according to Zaanen [Ref 5]. The authors give necessary and sufficient conditions that h transfers functions of the classes L^M , L_M , L_M^κ into such ones of L^{M_1} , L_{M_1} , $L_{M_1}^\infty$. Furthermore,

conditions for the boundedness and continuity of h as well as conditions for the continuity and weak semicontinuity of f are given. Altogether ten theorems are formulated.

There are 12 references, 7 of which are Soviet, 3 Polish and 2 Dutch.

ASSOCIATION: Moskovskiy oblastnoy pedagogicheskiy institut imeni N.K.Krupskoy
(Pedagogical Institute of the Moscow Oblast imeni N.K.Krupskaya)

PRESENTED: February 7, 1958, by S.L.Sobolev, Academician

SUBMITTED: February 7, 1958
1. Topology 2. Operators (Mathematics)

Card 1/1

AUTHORS: Vaynberg, M.M., and Engel'son, Ya.L. SOV/20-122-5-2/56

TITLE: On the Square Root of a Linear Operator in Locally Convex Spaces
(O kvadratnom korne iz lineynogo operatora v lokal'no vypuklykh prostranstvakh)

PERIODICAL: Doklady Akademii nauk, SSSR, 1958, Vol 122, Nr 5, pp 755-758 (USSR)

ABSTRACT: Vaynberg [Ref 1] investigated the square root of a linear completely continuous operator from L^q into L^p ($\frac{1}{p} + \frac{1}{q} = 1$). These results were extended by Engel'man [Ref 2] to an extended class of linear completely continuous operators in locally convex spaces. The present paper contains seven theorems on the square root of a linear bounded operator in locally convex spaces, where the assumption of the complete continuity is dropped. Let E be locally convex, E' strongly conjugate to E ; Let H be a Hilbert space dense in E' , $E \subset H \subset E'$; Let the topology of E majorize the topology in E introduced by H ; let the same be valid for the topologies of H and E' ; for $y \in H$, let the bilinear functional $\langle x, y \rangle$, where $y \in E'$ and $x \in E$ or $x \in E''$, be identical in H with the scalar product.

Theorem: Let A be a linear bounded operator of E' in E being selfadjoint and positive in H . Then the square root $A^{1/2}$ of the operator A considered in H is a bounded operator of H in E'' and

Card 1/2

On the Square Root of a Linear Operator in Locally Convex Spaces SOV/20-122-5-2/56

has a continuous continuation $\tilde{A}^{1/2}$ of E' into H .

Theorem: If E is a quasi barrel space (= espace tonnelle), then

$A \sim A^{1/2} \tilde{A}^{1/2}$.

There are 7 references, 4 of which are Soviet, 1 American, and 2 French.

ASSOCIATION: Moskovskiy oblastnoy pedagogicheskiy institut imeni N.K.Krupskoy
(Moscow Oblast Pedagogical Institute imeni N.K. Krupskaya)
Latviyskiy gosudarstvennyy universitet imeni P.Stuchki
(Latvian State University imeni P.Stuchka)

PRESENTED: June 3, 1958, by S.L.Sobolev, Academician

SUBMITTED: June 2, 1958

Card 2/2